Center Innovation Fund: JSC CIF

Hybrid Windows and Mosaic Video: Reducing Complexity of Space Habitable Modules

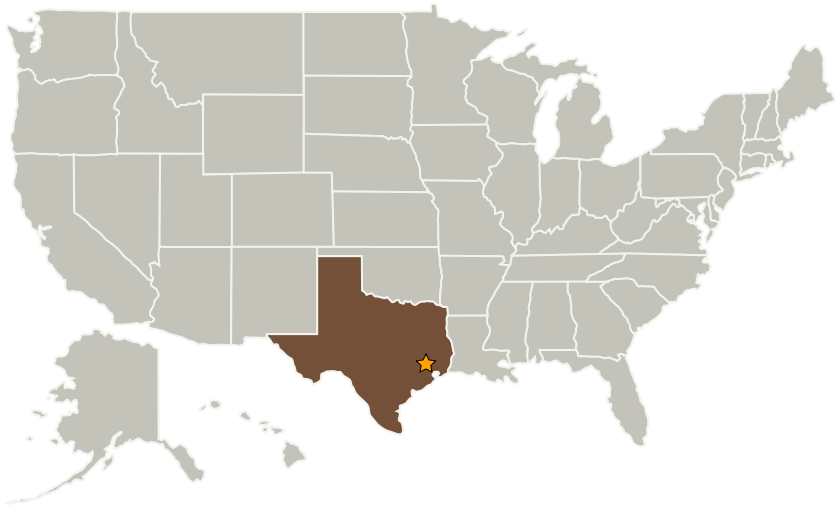
Completed Technology Project (2012 - 2013)

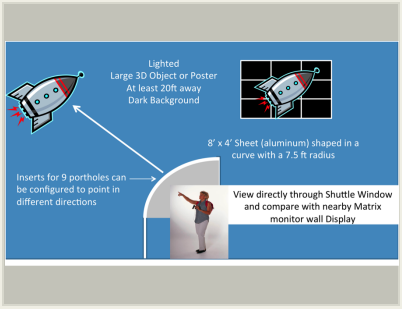
Project Introduction

We want to look at the concept of combining small, passive windows with replaceable cameras to improve viewing capabilities for habitable modules of future spacecraft. A more modular concept than currently used for spacecraft windows, this concept would reduce the overall window square footage for a vehicle or habitat, yet increase the viewing capabilities around it, and be available for both passive and electronic (video camera, IR sensors, etc) methods. This project would evaluate configurations of small portal windows with internally placed imaging sensors, pointed in various directions, and integrated views of near real-time video.

Windows in habitable modules represent significant design and operations impacts to future spacecraft, yet viewing requirements, both electronic and passive, continue to mature. With longer missions over greater distances, it becomes harder to accommodate both size and modularity of viewing. The Hybrid Window Portal would allow easier design, more locations for direct viewing, and easier maintenance and represent less of an impact to a vehicle's structural integrity than traditional windows, and applies to aluminum, composite and inflatable structures. This project intends to build on an on-going IR&D effort and a 2011 ICA investigation of virtual window technology, and will explore options to provide adequate viewing and sensing through arrangements of multiple, small portals that can accommodate cameras and sensors. Smaller portals accommodate more cameras and sensors than ever before, and offer different pointing directions so optimum viewing angles can be selected, while an integrated view (Mosaic Video) provides perspective.

Primary U.S. Work Locations and Key Partners





Project Image Hybrid Windows and Mosaic Video: Reducing Complexity of Space Habitable Modules

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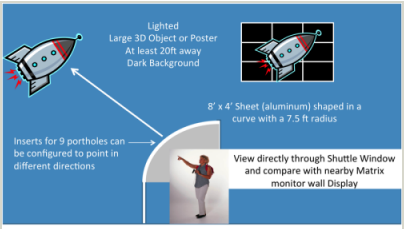
Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations
Texas

Images



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Project Image Hybrid Windows and Mosaic Video: Reducing Complexity of Space Habitable Modules *(https://techport.nasa.gov/image/2251)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Center / Facility:
Johnson Space Center (JSC)

Responsible Program:
Center Innovation Fund: JSC CIF

Project Management

Program Director:
Michael R Lapointe

Program Manager:
Carlos H Westhelle

Project Manager:
Helen M Neighbors

Principal Investigator:
Helen M Neighbors

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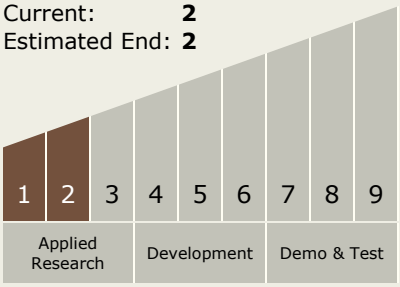
Completed Technology Project (2012 - 2013)

Technology Maturity (TRL)

Start: **1**
Current: **2**
Estimated End: **2**



Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.5 Autonomous Rendezvous and Docking
    - TX04.5.1 Relative Navigation Sensors